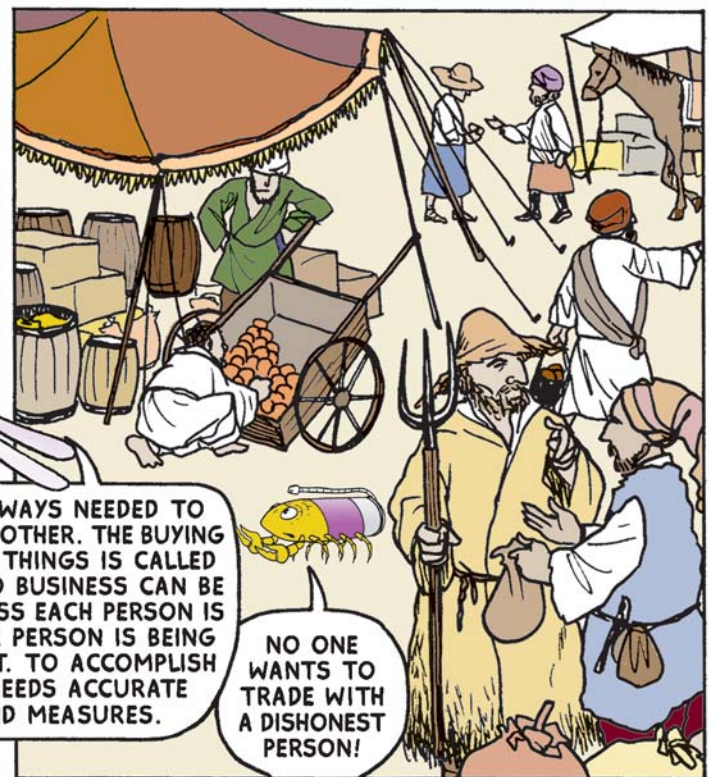
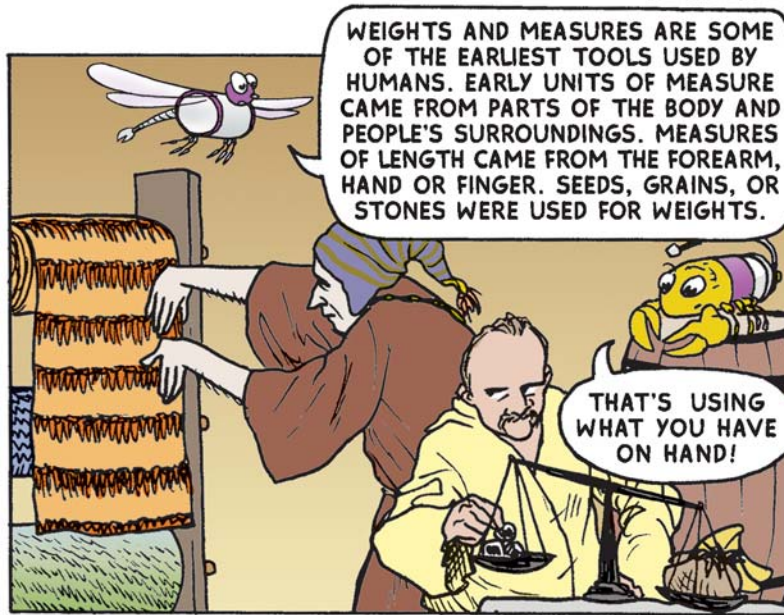


PEOPLE HAVE ALWAYS NEEDED TO TRADE WITH EACH OTHER. THE BUYING AND SELLING OF THINGS IS CALLED "**COMMERCE**." NO BUSINESS CAN BE CONDUCTED UNLESS EACH PERSON IS SURE THE OTHER PERSON IS BEING FAIR AND HONEST. TO ACCOMPLISH THIS, TRADE NEEDS ACCURATE WEIGHTS AND MEASURES.

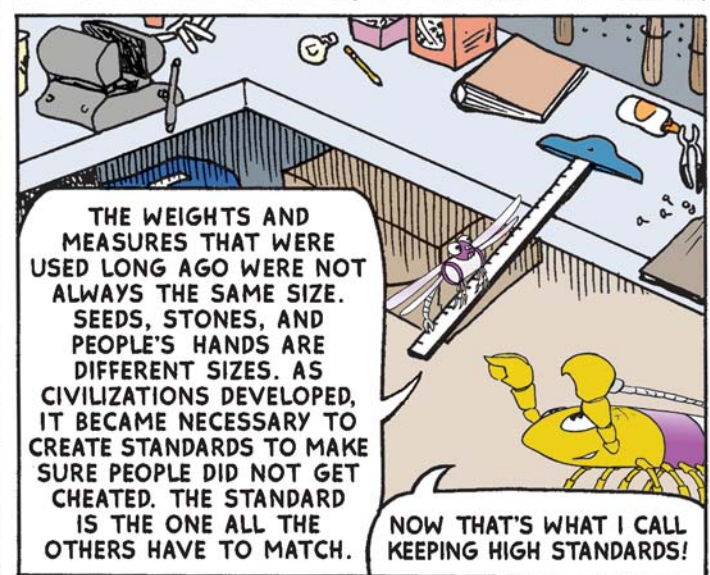


NO ONE WANTS TO TRADE WITH A DISHONEST PERSON!



WEIGHTS AND MEASURES ARE SOME OF THE EARLIEST TOOLS USED BY HUMANS. EARLY UNITS OF MEASURE CAME FROM PARTS OF THE BODY AND PEOPLE'S SURROUNDINGS. MEASURES OF LENGTH CAME FROM THE FOREARM, HAND OR FINGER. SEEDS, GRAINS, OR STONES WERE USED FOR WEIGHTS.

THAT'S USING WHAT YOU HAVE ON HAND!



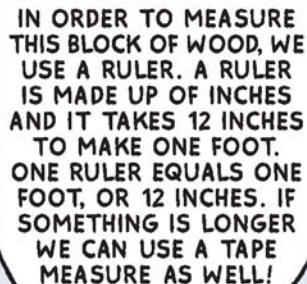
THE WEIGHTS AND MEASURES THAT WERE USED LONG AGO WERE NOT ALWAYS THE SAME SIZE. SEEDS, STONES, AND PEOPLE'S HANDS ARE DIFFERENT SIZES. AS CIVILIZATIONS DEVELOPED, IT BECAME NECESSARY TO CREATE STANDARDS TO MAKE SURE PEOPLE DID NOT GET CHEATED. THE STANDARD IS THE ONE ALL THE OTHERS HAVE TO MATCH.

NOW THAT'S WHAT I CALL KEEPING HIGH STANDARDS!

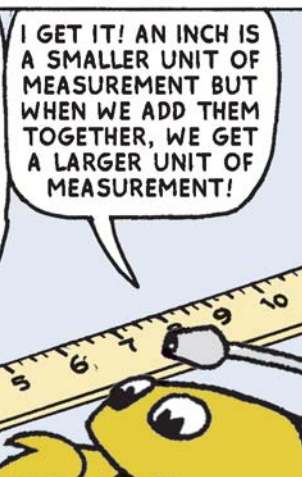


I HOPE I GET THIS RIGHT!  
I'M MEASURING JUST  
LIKE IN ANCIENT TIMES!

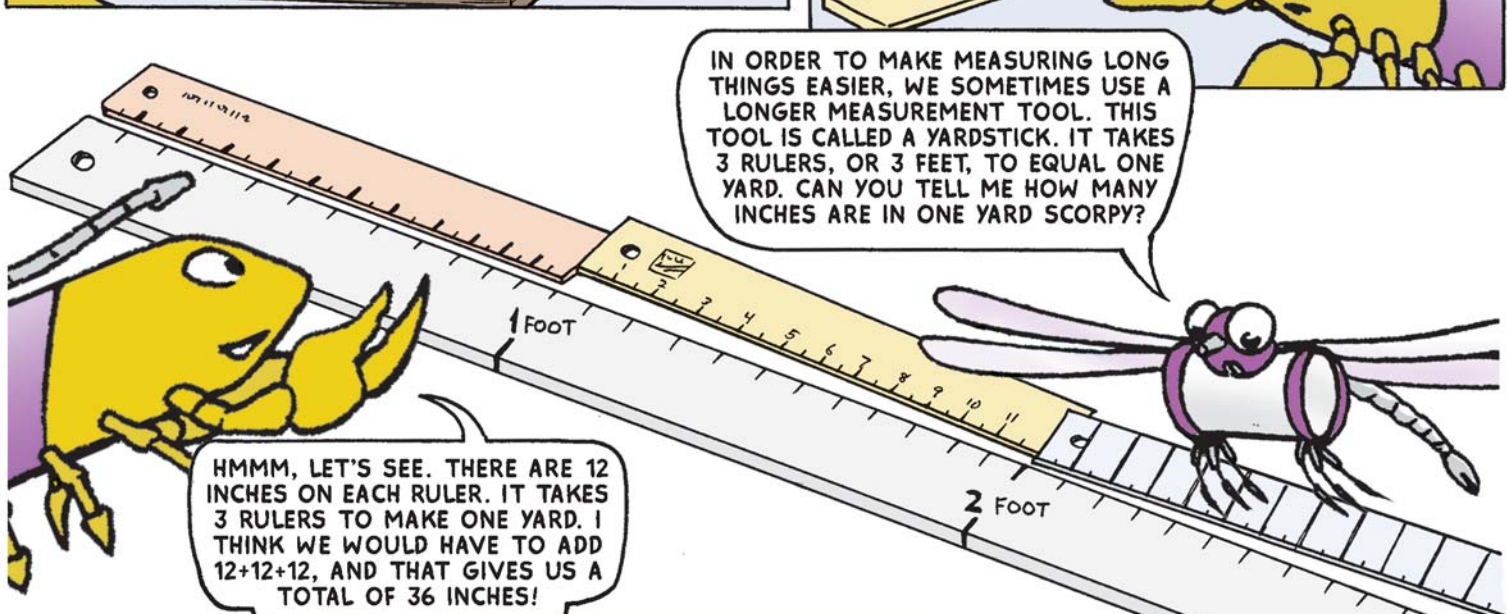
HOLD ON SCORPY!  
WE HAVE TOOLS THAT  
HELP US MEASURE  
ACCURATELY NOW.  
LET'S PUT SOME  
OF THEM TO USE.




IN ORDER TO MEASURE  
THIS BLOCK OF WOOD, WE  
USE A RULER. A RULER  
IS MADE UP OF INCHES  
AND IT TAKES 12 INCHES  
TO MAKE ONE FOOT.  
ONE RULER EQUALS ONE  
FOOT, OR 12 INCHES. IF  
SOMETHING IS LONGER  
WE CAN USE A TAPE  
MEASURE AS WELL!



I GET IT! AN INCH IS  
A SMALLER UNIT OF  
MEASUREMENT BUT  
WHEN WE ADD THEM  
TOGETHER, WE GET  
A LARGER UNIT OF  
MEASUREMENT!



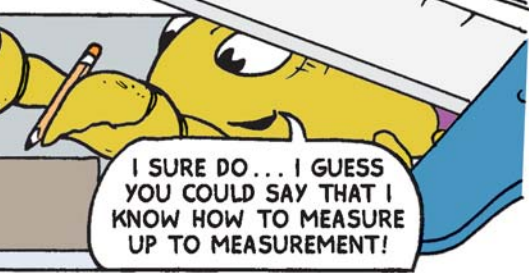
IN ORDER TO MAKE MEASURING LONG  
THINGS EASIER, WE SOMETIMES USE A  
LONGER MEASUREMENT TOOL. THIS  
TOOL IS CALLED A YARDSTICK. IT TAKES  
3 RULERS, OR 3 FEET, TO EQUAL ONE  
YARD. CAN YOU TELL ME HOW MANY  
INCHES ARE IN ONE YARD SCORPY?



HMMM, LET'S SEE. THERE ARE 12  
INCHES ON EACH RULER. IT TAKES  
3 RULERS TO MAKE ONE YARD. I  
THINK WE WOULD HAVE TO ADD  
 $12+12+12$ , AND THAT GIVES US A  
TOTAL OF 36 INCHES!



YOU HAVE A GOOD  
UNDERSTANDING OF  
MEASUREMENT SCORPY!



I SURE DO... I GUESS  
YOU COULD SAY THAT I  
KNOW HOW TO MEASURE  
UP TO MEASUREMENT!

WHAT ARE YOU DOING SCORPY!

I HAVE TO DECIDE WHAT COLOR TO PAINT MY BIRDHOUSE AND I'M MEASURING HOW MUCH PAINT I WILL NEED!!!

HOLD ON SCORPY! WE USE A RULER OR YARDSTICK TO MEASURE LENGTH BUT WE USE A TOTALLY DIFFERENT SYSTEM TO MEASURE MASS AND VOLUME. PAINT IS A LIQUID, SO WE WANT TO MEASURE THE VOLUME, OR THE AMOUNT OF PAINT IN THE CAN.

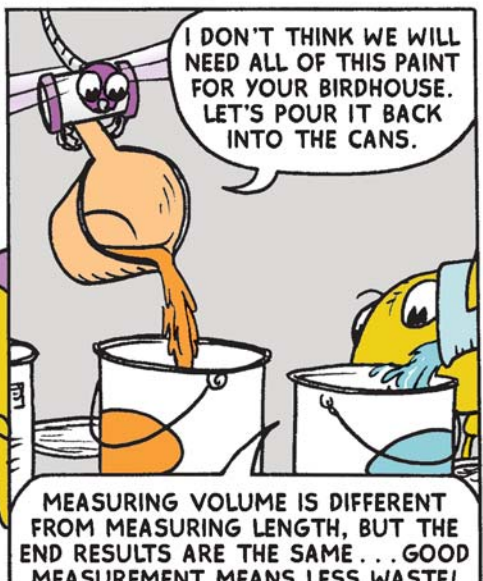
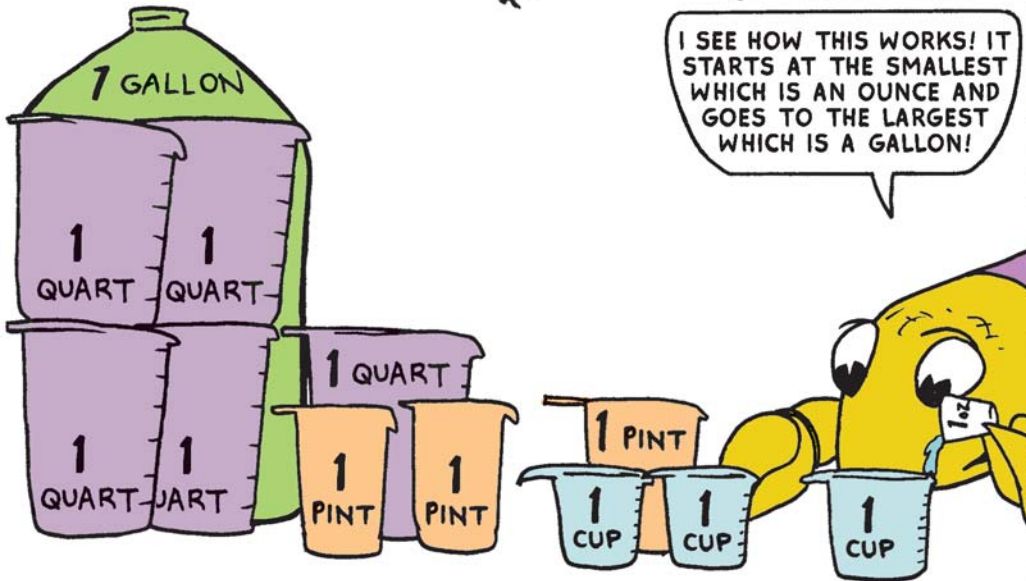
MEASURING THE CAN DOESN'T TELL US HOW MUCH PAINT IS INSIDE! IN THIS CASE, IT'S WHAT INSIDE THAT MATTERS!!

TO MEASURE VOLUME WE USE STANDARD MEASUREMENT TERMS SUCH AS OUNCE, PINT, QUART AND GALLON. IT TAKES EIGHT OUNCES TO MAKE ONE CUP. TWO CUPS MAKE ONE PINT. TWO PINTS MAKE ONE QUART AND FOUR QUARTS MAKE ONE GALLON.

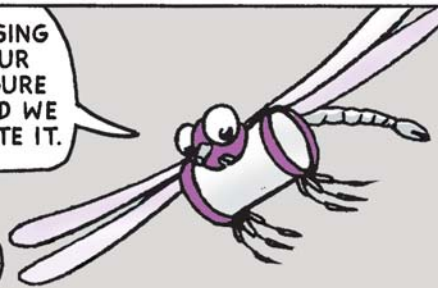
I SEE HOW THIS WORKS! IT STARTS AT THE SMALLEST WHICH IS AN OUNCE AND GOES TO THE LARGEST WHICH IS A GALLON!

I DON'T THINK WE WILL NEED ALL OF THIS PAINT FOR YOUR BIRDHOUSE. LET'S POUR IT BACK INTO THE CANS.

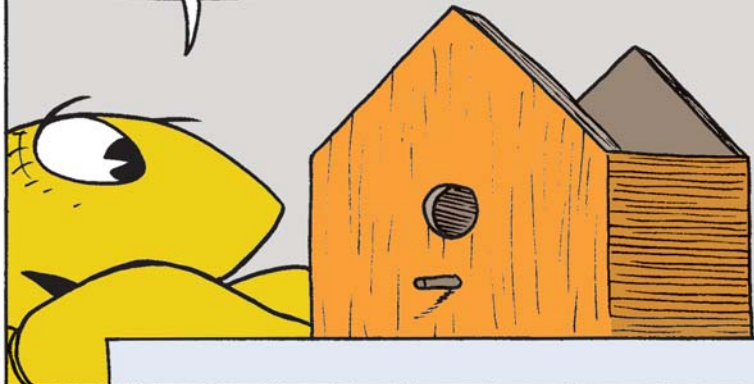
MEASURING VOLUME IS DIFFERENT FROM MEASURING LENGTH, BUT THE END RESULTS ARE THE SAME... GOOD MEASUREMENT MEANS LESS WASTE!



THE ONLY THING MISSING IS THE ROOF TO YOUR BIRDHOUSE. LET'S FIGURE OUT HOW MUCH WOOD WE WILL NEED TO COMPLETE IT.



I GUESS WE NEED TO MEASURE AGAIN!!



I CAN'T FIND MY RULER, YARDSTICK, OR TAPE MEASURE! HOW WILL WE EVER FINISH MY BIRDHOUSE??



SOMETIMES IT'S NOT NECESSARY TO GET AN EXACT MEASUREMENT OF SOMETHING. WE CALL THIS **ESTIMATING**.



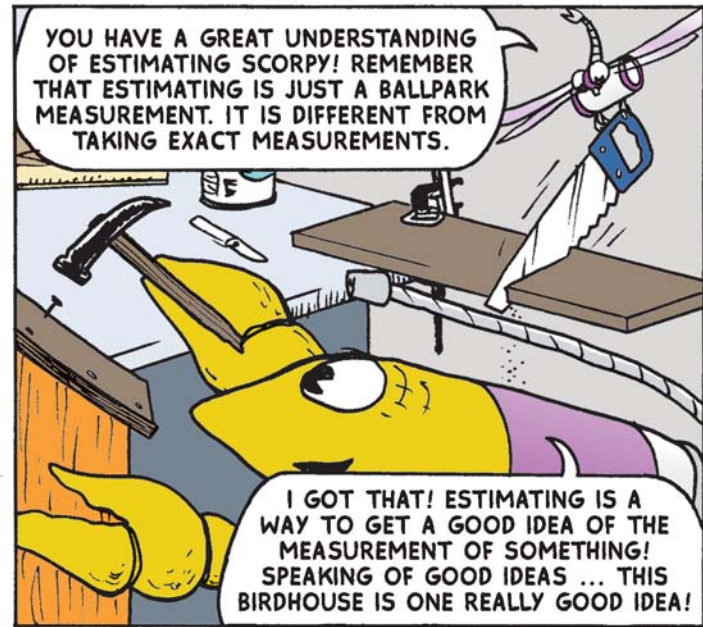
WE KNOW THIS BLOCK OF WOOD IS ABOUT 12 INCHES LONG. IT MAY NOT BE EXACTLY 12 INCHES BUT IT IS CLOSE. WHEN WE HOLD THIS BLOCK UP TO THE BIRDHOUSE, WE CAN SEE THAT IT WILL TAKE TWO BLOCKS OF WOOD THIS SIZE TO MAKE A ROOF.



I SEE ... ONE PIECE OF WOOD ON ONE SIDE AND ONE ON THE OTHER. SO THE ESTIMATE IS THAT WE WILL NEED AT LEAST 24 INCHES OF WOOD TO MAKE THE ROOF, BECAUSE  $12+12$  EQUALS 24!



YOU HAVE A GREAT UNDERSTANDING OF ESTIMATING SCORPY! REMEMBER THAT ESTIMATING IS JUST A BALLPARK MEASUREMENT. IT IS DIFFERENT FROM TAKING EXACT MEASUREMENTS.



I GOT THAT! ESTIMATING IS A WAY TO GET A GOOD IDEA OF THE MEASUREMENT OF SOMETHING! SPEAKING OF GOOD IDEAS ... THIS BIRDHOUSE IS ONE REALLY GOOD IDEA!

I HOPE THE BIRDS LIKE THE NEW HOUSE WE BUILT FOR THEM, DRAGONFLY! I THINK THIS SPOT IS GREAT! I NEVER REALIZED HOW BIG THE FENCE IS IN OUR BACKYARD. IT MUST BE A MILLION FEET LONG!

DO YOU REALLY THINK SO? MAYBE WE NEED TO USE OUR NEWLY FOUND MEASUREMENT SKILLS TO FIND OUT HOW LONG OUR FENCE REALLY IS!

WHEN WE MEASURE THE DISTANCE AROUND A CLOSED FIGURE, SUCH AS OUR BACKYARD, WE CALL THIS THE PERIMETER.

PERIMETER? THAT'S A NEW WORD!

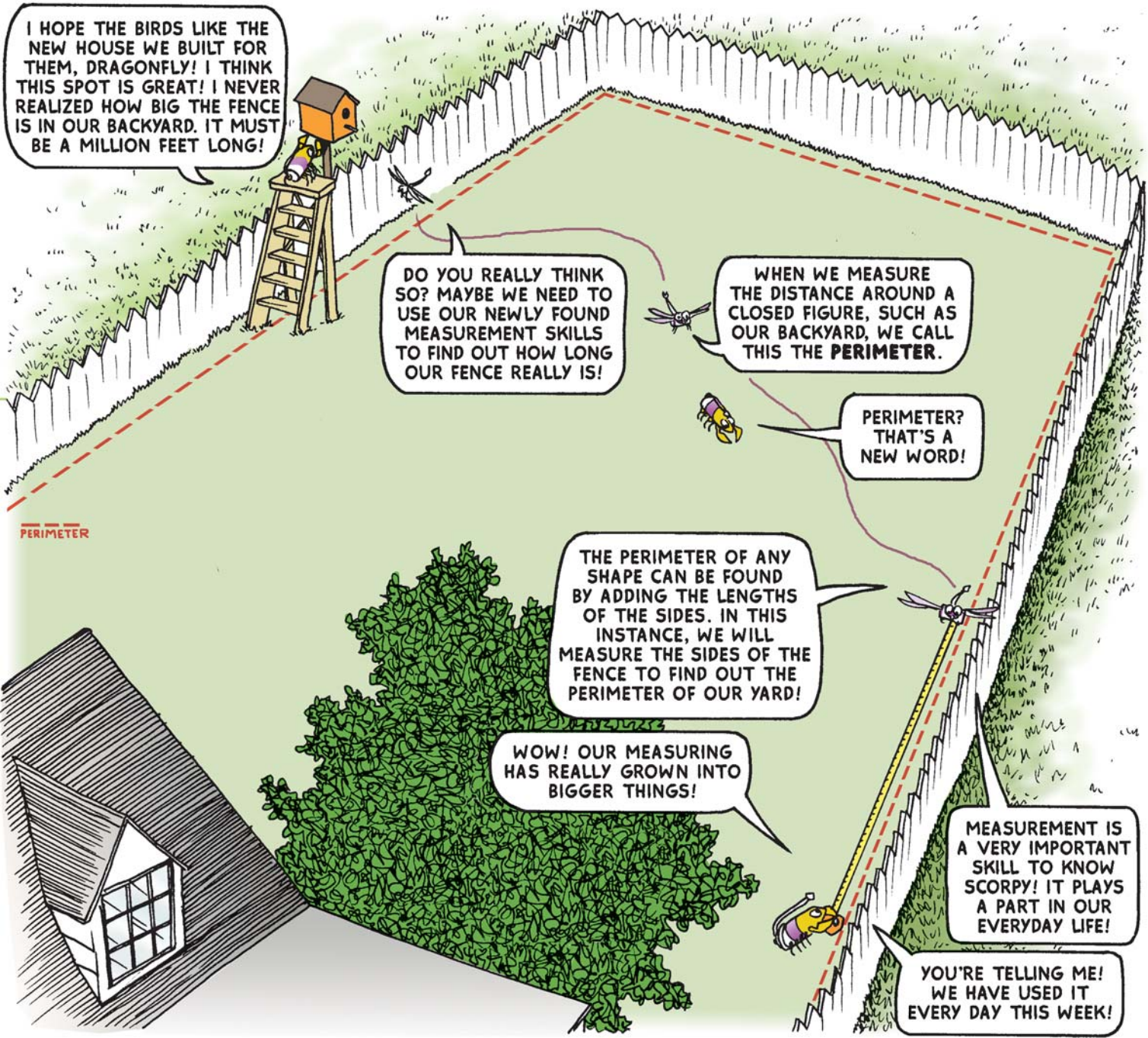
THE PERIMETER OF ANY SHAPE CAN BE FOUND BY ADDING THE LENGTHS OF THE SIDES. IN THIS INSTANCE, WE WILL MEASURE THE SIDES OF THE FENCE TO FIND OUT THE PERIMETER OF OUR YARD!

WOW! OUR MEASURING HAS REALLY GROWN INTO BIGGER THINGS!

MEASUREMENT IS A VERY IMPORTANT SKILL TO KNOW SCORPY! IT PLAYS A PART IN OUR EVERYDAY LIFE!

YOU'RE TELLING ME! WE HAVE USED IT EVERY DAY THIS WEEK!

PERIMETER



THIS DOGHOUSE NEEDS SOME WORK! DID YOU MEASURE THE WOOD BEFORE YOU CUT IT, SCORPY?

MEASURE?? WHY WOULD I DO THAT?

THE WOOD NEEDS TO BE THE SAME SIZE SO IT FITS TOGETHER. LET'S MEASURE IT WITH THE ENGLISH SYSTEM. A RULER IS 12 INCHES OR 1 FOOT LONG AND THE YARDSTICK IS 36 INCHES OR 3 FEET LONG. LET'S MEASURE THE WOOD SO THAT THESE PIECES ARE ALL 1 YARD LONG.

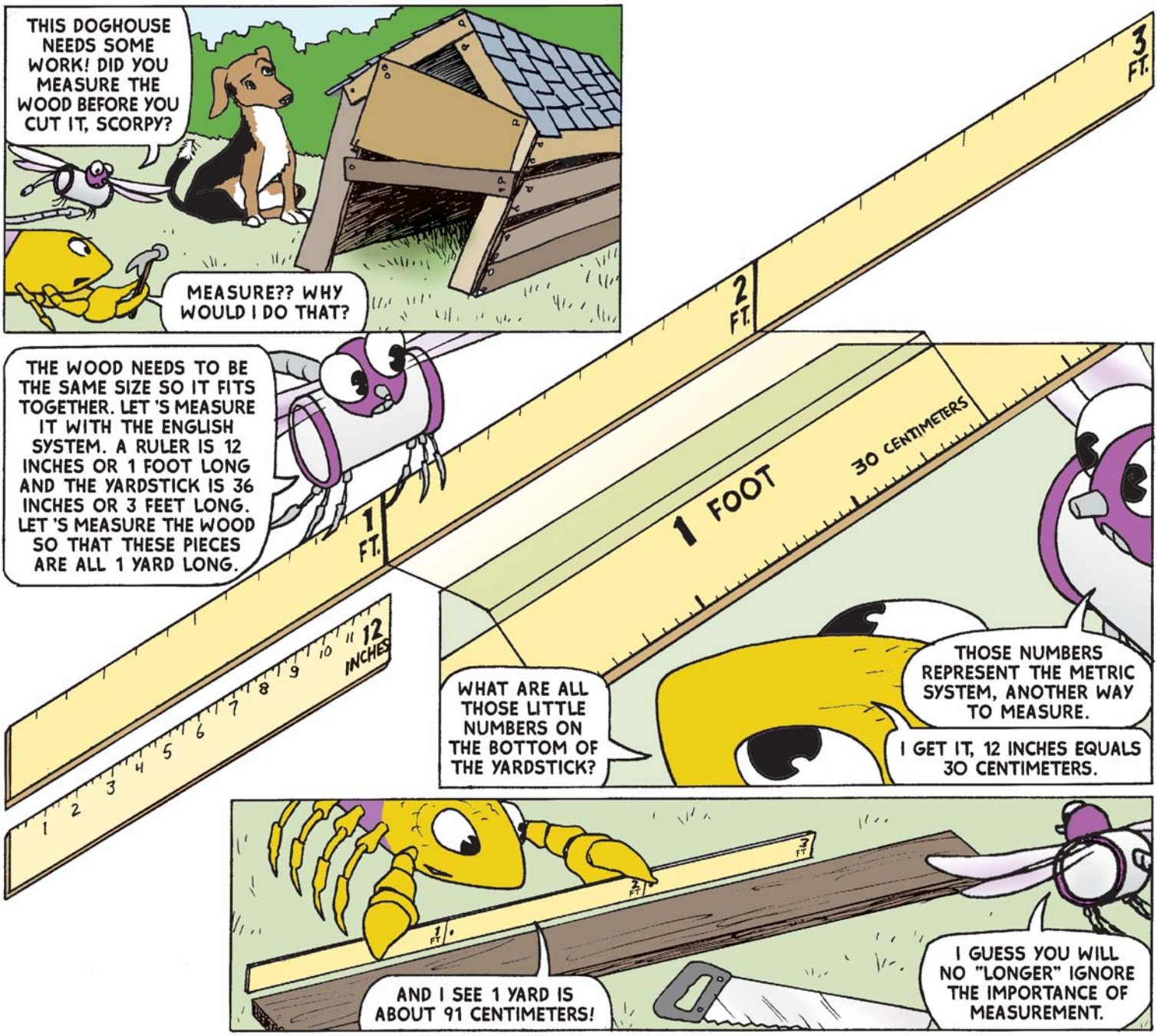
WHAT ARE ALL THOSE LITTLE NUMBERS ON THE BOTTOM OF THE YARDSTICK?

THOSE NUMBERS REPRESENT THE METRIC SYSTEM, ANOTHER WAY TO MEASURE.

I GET IT, 12 INCHES EQUALS 30 CENTIMETERS.

AND I SEE 1 YARD IS ABOUT 91 CENTIMETERS!

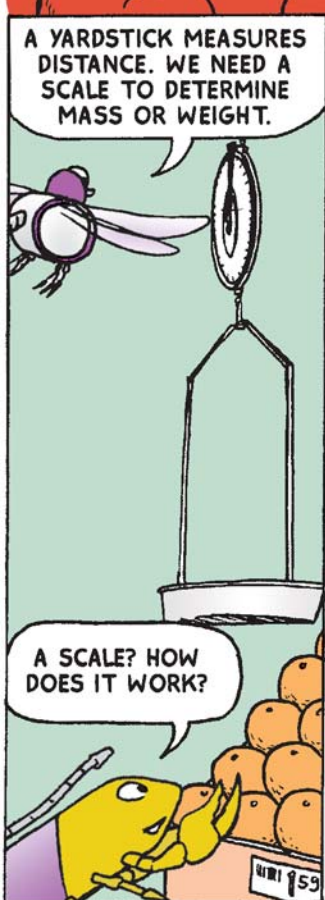
I GUESS YOU WILL NO "LONGER" IGNORE THE IMPORTANCE OF MEASUREMENT.





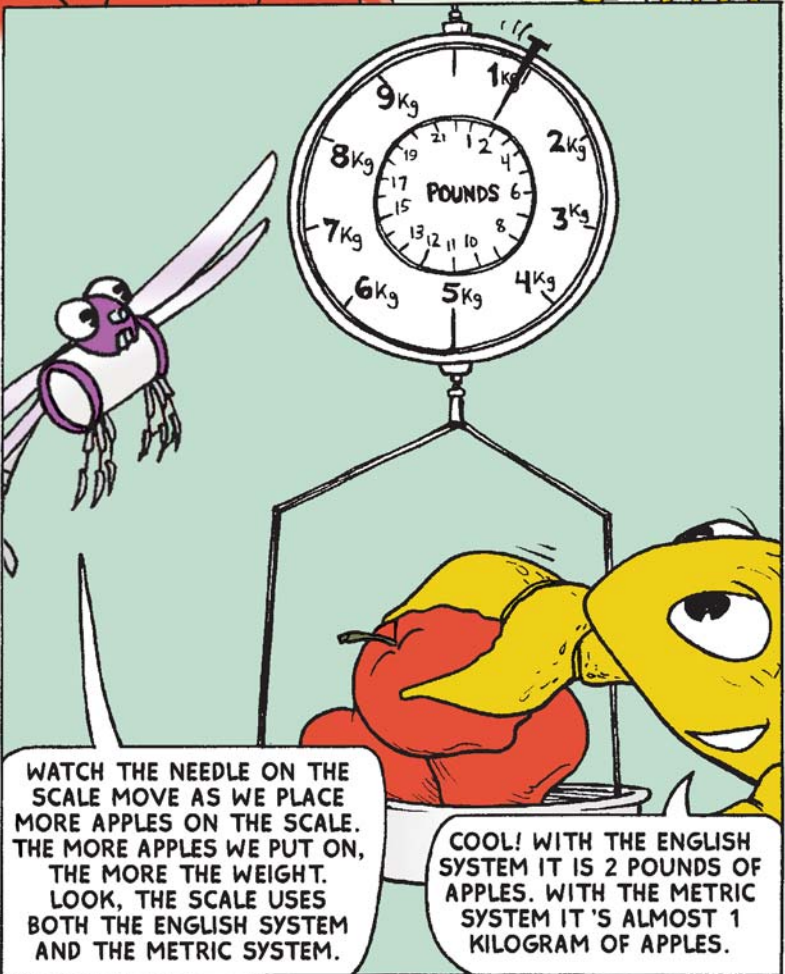
I NEED 2 POUNDS OF THESE APPLES. PLEASE WEIGH THEM FOR ME, SCORPY.

SURE! I'LL USE MY YARDSTICK!



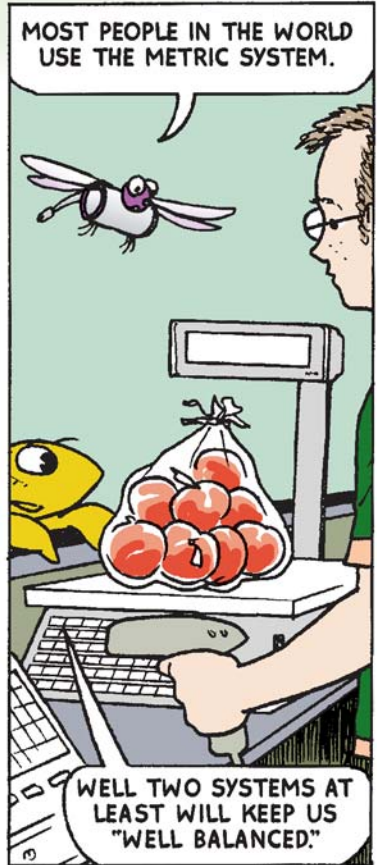
A YARDSTICK MEASURES DISTANCE. WE NEED A SCALE TO DETERMINE MASS OR WEIGHT.

A SCALE? HOW DOES IT WORK?



WATCH THE NEEDLE ON THE SCALE MOVE AS WE PLACE MORE APPLES ON THE SCALE. THE MORE APPLES WE PUT ON, THE MORE THE WEIGHT. LOOK, THE SCALE USES BOTH THE ENGLISH SYSTEM AND THE METRIC SYSTEM.

COOL! WITH THE ENGLISH SYSTEM IT IS 2 POUNDS OF APPLES. WITH THE METRIC SYSTEM IT'S ALMOST 1 KILOGRAM OF APPLES.



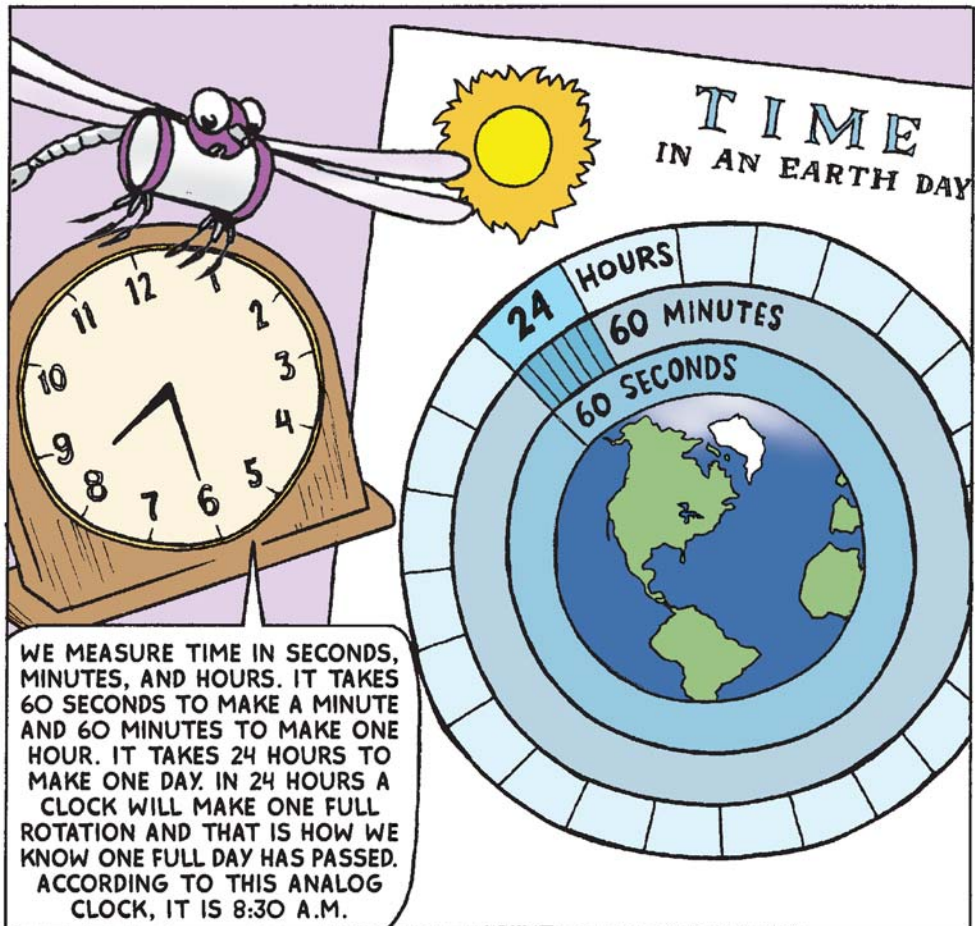
MOST PEOPLE IN THE WORLD USE THE METRIC SYSTEM.

WELL TWO SYSTEMS AT LEAST WILL KEEP US "WELL BALANCED."

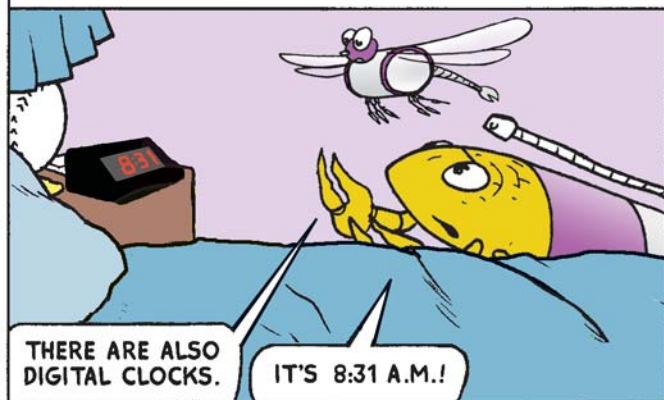


I'M GOING TO BE LATE FOR SCHOOL!

CALM DOWN, SCORPY! LET'S LOOK AT A CLOCK AND SEE WHAT TIME IT IS!

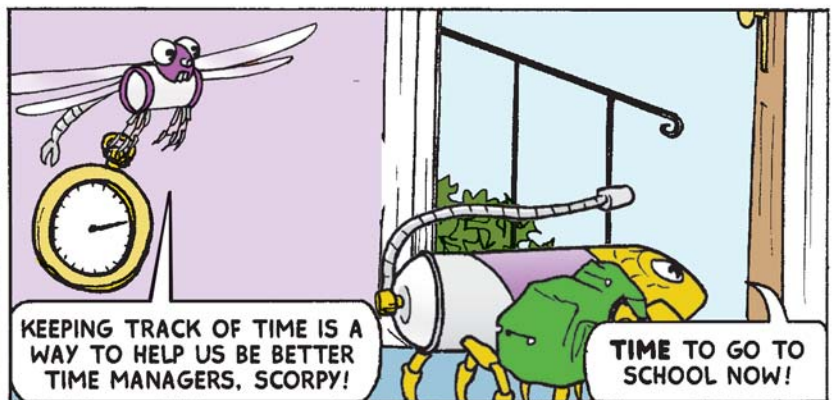


WE MEASURE TIME IN SECONDS, MINUTES, AND HOURS. IT TAKES 60 SECONDS TO MAKE A MINUTE AND 60 MINUTES TO MAKE ONE HOUR. IT TAKES 24 HOURS TO MAKE ONE DAY. IN 24 HOURS A CLOCK WILL MAKE ONE FULL ROTATION AND THAT IS HOW WE KNOW ONE FULL DAY HAS PASSED. ACCORDING TO THIS ANALOG CLOCK, IT IS 8:30 A.M.



THERE ARE ALSO DIGITAL CLOCKS.

IT'S 8:31 A.M.!



KEEPING TRACK OF TIME IS A WAY TO HELP US BE BETTER TIME MANAGERS, SCORPY!

TIME TO GO TO SCHOOL NOW!



